

ABSTRACT

A method and system (10) for selectively removing one component of a material thereby concentrating other components of the material are disclosed. The material is cooled to below the melting temperature of the material to form a supercooled liquid phase with heat transfer plate with cooling channels (20). Ultrasonic energy from ultrasonic drivers (42) is applied to the material to form solid phase crystals of the component to be removed. These crystals are removed to leave the concentrated product. The ultrasonic energy prevents the growth of dendrites on the crystals, resulting in the formation and removal of small crystals of the component to be removed without damage to or removal of the remaining components. Methods and apparatuses for cryoprecipitation and chromatography are also disclosed.